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## EXCEPTIONAL RAIN-STORM IN MALTA.

Mr. T. Agius, the officer in charge of the Meteorological Observatory of the Malta University has forwarded to us particulars of the rainfall for Monday, November 22nd, 1915, when a rain-storm of quite exceptional violence prevailed over Malta and the neighbouring small islands. It is gratifying to know that rainfall records are kept at the elementary schools in this small possession, and the list contains the readings taken at 39 of these. They are well distributed over the whole area, and a key map having been sent we have been able to plot the results and draw isohyetal lines in exactly the same way as in the section on Heavy Falls on Rainfall Days in *British Rainfall*. This map is reproduced herewith and shows in inches all the falls reported. It will help the reader to realize the scale when it is mentioned that the whole area of the three islands is 117 square miles, exactly the same as that of the county of London. It will be observed that on the day in question not less than about an inch and a half of rain fell over the entire area, while 68 square miles in the main island had more than 5 inches and about 10 square miles in the centre more than 7 inches. The highest reading was 8·60 inches. Had it not been for the great Norfolk rain-storm of August 25th—26th, 1912, we should have been inclined to say that a downpour of this magnitude could not occur in the British Isles, but we have learned caution in expressing opinions as to possible maxima. The great precipitation in Malta was not accompanied by any striking fall in the barometer, the total drop being from 29·987 inches at 8 a.m. on the 21st to 29·810 inches at 8 a.m. on the 22nd, but probably there was a much lower barometric minimum out at sea which influenced the storm. Mr. Agius states that "the amount of rain registered was nearly equal to that recorded on another remarkable outburst known as St. Nicholas' day, which occurred some forty years ago. . . The rainfall registered at the Observatory was equal to 7·24 inches [on November 22nd, 1915]. Although exceptionally heavy, still this fall is not to be compared with that recorded during the cloud burst of the 16th October, 1913, when 11·57 inches of rain fell in Valletta, the maximum recorded, that at Vittoriosa, reaching the extraordinary amount of 16·3 inches in a few hours of rain."

## A PRACTICAL APPLICATION OF ANEMOMETRY.

By R. H. CURTIS.

A good many years ago I was asked by a friend to look over his meteorological observatory, upon which he had spent a good deal of money in making it as complete as possible. In the course of my visit I met my friend's father who, after I had expressed my pleasure at what I had seen, said "Well, *Cui bono*?" The same question has, I daresay, been asked of many meteorological Observers, and perhaps a quite satisfying answer has not always been ready; at all events there can be few instances in which such a directly utilitarian use of a meteorological instrument can be shown as in the case of an anemometer at Quilty, a station on the West Clare Railway, an account of which will probably interest readers of this magazine.

The "West Clare" is one of the "Irish Light Railways" with which the name of Mr. A. J. Balfour is intimately associated. It runs from Ennis to Kilkee, and, for 36 miles of that distance it follows the Atlantic sea-board, exposed without the least shelter to the full fury of all westerly gales, and there is probably no other railway in the United Kingdom so utterly exposed as is this stretch of 36 miles.

Derailment of trains in heavy gales has occurred on many lines in various parts of the Kingdom, but here we have not only exceptional exposure, but also a very narrow wheel-base upon which the carriage stands, and it is obvious that the narrower this is the more liable the carriage must be to be overturned; it is therefore not surprising that in the short period which had elapsed between the opening of the line and the beginning of 1909 as many as five "*blow-offs*" had occurred upon it, the guage being only 3 feet.

Fortunately in these accidents no lives were lost, but on each occasion the carriages were completely smashed, and lives put in great danger. The Board of Trade therefore called for measures to be taken to prevent such accidents and a first attempt was made to do so by throwing up shelter banks upon the windward side of the line, at the most exposed points; this scheme however had to be abandoned as ineffective, and also too expensive, and a method was then sought for giving warning when the wind became dangerous, so that precautionary steps might be taken to prevent accidents.

It was at this point that Mr. W. Barrington, M.Inst., C.E., the Engineer in Chief of the line, consulted the Meteorological Office, and the matter came to me as Superintendent of Instruments. It seemed to me that the Pressure-tube Anemometer could be arranged to give electrically the warning required, and my scheme was carried out by the late Mr. R. Munro.

The arrangement is designed to give two warnings by the ringing of a bell in the station-master's house—the first when the anemometer indicates a wind velocity of 65 miles per hour, and the second if, and when, the velocity rises to 85 miles per hour.

The lightest vehicles on the line require, when empty, a side-pressure of $15\frac{3}{4}$ pounds per square foot to overturn them, and since the wind-pressure when the first warning is given would be less than 13 pounds per square foot, a considerable margin is left for safety. But when this first warning has been given 24 hundredweights of moveable ballast, kept for the purpose at every station, is placed on each vehicle of any train upon the line, at the first station it reaches; by so doing its stability is increased so that a pressure of $25\frac{1}{2}$ pounds per square foot would now be required to overturn it, and therefore the train is allowed to continue its journey. If the wind continues to rise, and reaches a velocity of 85 miles per hour, the second warning is given and the train is then stopped until the storm abates, but since the equivalent pressure per square foot would then be but $21\frac{1}{2}$ lbs. there is again a good margin for safety. These limits were agreed to by the Board of Trade.

The mechanical arrangement by which these warnings are obtained is very simple. To the cover of the cistern of the Anemometer an ebonite base is attached, and carries two uprights, connected by a horizontal rod some inches above the base. This horizontal rod serves as an axis for two balanced arms, or triggers, each of which supports, very delicately, a sliding weight; the upper part of each trigger projects forward towards the pen-rod, but at different angles, to the vertical, and the two are far enough apart to allow the pen-rod to pass between them. On either side of the pen-rod is fixed a small projecting pin, and when the rod has risen to a height corresponding to a wind velocity of 65 miles per hour one pin disengages the lower trigger, and thus allows the weight it had supported to fall. This weight completes an electric circuit and a loud bell is rung in the station-master's house, and continues to ring until stopped by the station-master, whose duty it then, is to send the warning up and down the line to every station.

The fallen trigger is not replaced, and the action of the pen-rod continues, but if the wind still rises and reaches a gust velocity of 85 miles per hour the other trigger is disengaged by the second pin, the bell is again rung, and a message stopping all traffic on the line is at once despatched.

Since its installation in December, 1909, I am informed that "the instrument has never failed to give the required warning when the velocity of the wind reached dangerous limits." There has however been one storm-derailment on the line, "but that was entirely due to deliberate disregard of the instructions issued," and not to failure of the instrument to give its warning.

Mr. Barrington in a recent letter to me says: "So far as I have been able to ascertain I do not think any of the warning methods adopted on other lines in England, Wales and Scotland are as reliable as the one we have adopted, and certainly none are more scientific in their application."

# RELATION OF RAINFALL TO CLOUD-LEVEL: A PROBLEM OF CONDENSATION.

By L. C. W. Bonacina.

Early in 1907, whilst I was spending a few weeks in a hilly part of Surrey, I was puzzled one rather wet and dismal winter day when the top of the North Downs was obscured in cloud, to find that a decided, though by no means heavy, fall of rain which was taking place at the foot of the range, ceased or degenerated into a drizzle as I mounted into the mist. One cannot, of course, be sure of eliminating the time element when one is observing alone and changes one's location, but I seem to remember (though, unfortunately, I am not sure), that it was raining as before when I came down again.

Latterly, however, questions of this nature have been forced on my attention both summer and winter, in a much more favourable region for observing such effects than the Surrey Downs, namely, the Dartmoor hills in Devonshire, and although I cannot speak with the full confidence of a resident, I have little doubt that the following generalization is substantially true:—on and around Dartmoor, and no doubt the same applies to other hill districts, persistent, heavy rain does not fall when the moor is obscured in mist, but only when the higher summits are clear and beneath the cloud-level. It is, of course, perfectly true that the premonitory stage of approaching bad weather often manifests itself by the rise of thick mist on the hills and tors—just as, curiously enough, the opposite condition of unusual atmospheric transparency also often immediately precedes rain—but it may be taken, I think, as a pretty safe rule that until that mist disperses, or until, as it amounts to, the cloud-level rises above the hills, nothing like heavy or decided general rain will set in, either on or around the moor, or in the lowlands. Whilst making liberal allowance for the lax statements of people who are not meteorologists, especially if uneducated, I have questioned local men on this point, including the tenant of a solitary farmstead on a high and forbidding part of Dartmoor, and their answers all seem to support my conclusion that moorland mist and true rainfall do not, as a general rule, take place together. The mist, of course, is normally very wet, and must contribute largely to the big rainfall figures furnished by gauges set among the high hills; but it does at first sight appear strange that the conditions for mist and rainfall should occur at different times.

I assume that the only reliable physical criterion of the occurrence of condensation is the attainment of that particular state when the vapour ceases to behave like a gas and becomes saturated. We know that after the point of saturation is reached any further

decrease of temperature usually results in the precipitation of liquid or frozen water—in the form of cloud, rain or snow.

In practice we cannot tell precisely when the point of condensation or precipitation is reached in the atmosphere, because we have to rely on the *visibility* of moisture, which is at best a rough and untrustworthy guide. Quite apart from the question of defective eye-sight, there is a certain range of normal vision through even the densest fog, and it is often very curious to find that a surface fog in London hardly shows up at all across a narrow street. But I only introduce this aspect of the subject as a preliminary to the considerations which follow, and to point out that condensed vapour may to a certain extent exist in the air without always being visible, and that the only true criterion of the stage of condensation is not discernible by the senses, is not apparent, that is to say, to natural observations without the appliances of the physical laboratory.

On Dartmoor, a typical wet English hill district, when anything in the nature of heavy, persistent or general rain sets in, the cloud-level rises, leaving even the highest hills visible through a dense sheet of rain. I am only considering the cloud-level, and am not referring to the not uncommon phenomenon of surface rain-fog which hovers over saturated ground, especially in coombes and hollows. It would appear, that a decided cyclonic up-lift of the air leading to heavy rain is prejudicial to the formation of dense Dartmoor mists. The shifting moorland mists and driving drizzles occur, instead, with non-cyclonic moisture-laden winds, which, being forced upward by the hills, give rise to various forms of local showery precipitation, but leave the lowlands dry because they have no cyclonic uplift in their velocity. The prevailing conception of the processes of condensation and precipitation is, so far as I am aware, that when condensation has advanced beyond a certain stage in a cloud the mist particles run together into transparent rain-drops which, of course, fall as soon as they can no longer be supported by the resistance of the air; in other words that the cloud is *always* the mother of the rain, the latter, in a sense, being squeezed out as from a saturated sponge. Now I confess to have some difficulty in picturing to myself the mechanism of this process. If this *were* the actual process in the case of cyclonic rainfall a little reflection will shew that the lower part of an ascending cloud-mass would have rain falling through it, but that only the upper part would be *condensing* rain—a supposition hardly supported by the facts of observation so far as they go. In the case of heavy rain engendered by a vigorous upward movement of the air-currents. What, however, if in these cases, instead. of regarding the clouds as the main source of the rain which is falling beneath them, we regard them as the residue of the moisture, which has been rapidly condensed straight

into a transparent rain sheet and drained off below the cloud-level? Is there any difficulty in supposing that the damp Atlantic air currents which circulate through our cyclonic systems are borne aloft so rapidly that the vapour particles are, in the main at all events, condensed straight into transparent rain drops without first exhibiting the stage of cloud or mist particles? and that at a higher level, above the condensing rain sheet, where the vapour content of the air has become much reduced, or the ascending velocity weakened, there appears a dense cloud canopy in which condensation cannot get beyond the mist stage? This, indeed, is the process which in certain cases suggests itself to my imagination; and certain facts of observation stated above support this theory. If a more or less horizontal non-cyclonic westerly wind has its moisture locally condensed into a cloud or a shower when it is forced to rise against the obstruction of a hill-side, is it conceivable that an equally moist cyclonic wind with a strong vertical component in its own velocity plus the additional uplift imparted to it on meeting the hill, even though the *orographic* rise is less in the case of a wind with a vertical component, will not have any of its moisture condensed *at the level of that same hill slope* where no cloud is produced but heavy rain is falling? Ought we not rather to assume that in the cyclonic case condensation is actually proceeding so much more actively than in the local cloud case *at the hill-level* that the condensed moisture passes direct into heavy rain?

These are questions about which the rain-gauge can give us no information, and I would like to set every rainfall observer in hill districts studying the subject in all its bearings, and in the case of both rain and snow.

My own observations have not long commenced systematically, and then only on the eastern border of Dartmoor in view of Cosdon Beacon, a hill some 1800 feet high.

I should like to append some particular observations made by me at Chagford, Devon, on January 19th and 20th, 1916.

On the 19th a thick driving moorland drizzle prevailed all day with a moderate gale, and it seemed not unlikely that the conditions were quite local, "Dartymoor, born and bred." The higher parts of the moor were invisible from Chagford, but this seemed to be due rather to the limited degree of transparency of the mist than to true mist or cloud on the hills; moreover, the flying sky was in places half blue, and such cloud as there was overhead appeared to be the effect, again, of the low thick drizzle. In other words I think this was an occasion on which condensation into small drizzle occurred at a low level without any cloud residue (antea) over the rain sheet. During the ensuing night heavier rain set in, and about 8 o'clock next morning thunder marked the replacement of a muggy south-westerly wind by a colder westerly one. Just about noon a perishing squall of graupel suddenly swooped

down upon the moor from the north-west. The squall clouds were high up above the hills, but as the horizontal, or probably slightly downward wind-current behind the squall struck Cosdon Beacon a local cloud was generated on the hill, so that on the summit the sleet and graupel must have been sweeping through a fog of local and independent origin.

One would very much like to know all that happens on exposed mountain heights; but exposure to the fury of winter weather on our desolate British moorlands is not an experience to be courted.

I do not think that the idea of vapour being condensed straight into transparent raindrops need be more difficult to entertain than that of the passage of mist particles, or still more, uncondensed vapour direct into snow flakes. Moreover, the Hon. Ralph Abercromby in his "Weather," insists on the peculiar way cyclonic rain seems to "grow out of the air," an observation which I can confirm and which has materially helped me to nurture the above conception of condensation as representing what actually obtains very frequently in nature.

Finally I would particularly ask meteorological Observers in the Highlands, Wales, the Pennines and the Lake District to study the cloud behaviour of the mountains in relation to rainfall. Did no one study the *species* or appearance of rain on the top of Ben Nevis when the observatory was in existence?

## Correspondence.

*To the Editor of Symons's Meteorological Magazine.*

### A COLD WINTER FOLLOWING A COLD NOVEMBER.

In a recent number of your magazine one of your correspondents debates the probability of a cold winter following a cold November. We farmers have an old saying "If there's ice in November that will hold a duck, there'll be nought after but sludge and muck." This is being carried out this year, so far. It might be interesting to ask (and time only can answer), after this January shall we have a late spring; or a cold, wet summer?

S. ARROWSMITH.

*Mosley Hall, Whaley Bridge, February 3rd, 1916.*

[The November *canard* has also been cited by a Devonshire correspondent and no doubt we shall be reminded presently that, "If Candlemas Day be fair and clear, there'll be twa winters in the year." For the second winter has made itself obvious enough in the bitter weather and unmelted snows of the last week of February and the first week of March.—Ed., *S.M.M.*].

## THE SNOW-STORMS IN THE BLACK MOUNTAINS.

THE snowfall of February was the most remarkable I have experienced in my life. From February 20th the wind blew each day from easterly points and we have had as many as thirteen distinct snowstorms. It is very difficult to judge the true depth owing to the very high wind but my estimates of the fall on each day up to March 2nd were as follows :—

| | | | |
|---|---|---|---|
| Feb. 20th ... | 12 inches. | Feb. 28th ... | 12 inches. |
| ,, 24th ... | 8 ,, | ,, 29th ... | 4 ,, |
| ,, 25th ... | 9 ,, | Mar. 1st ... | 1 ,, |
| ,, 26th ... | 12 ,, | ,, 2nd ... | 15 ,, |
| ,, 27th ... | 3 ,, | | |

Total depth of undrifted snow Feb. 20th to Mar. 2nd 76 inches.

The total depth of undrifted snow during the whole period till the 11th I put at between seven and eight feet.

The railway is, of course, blocked and we are compelled to go on foot eight miles down the valley for food. Our coal is also nearly finished and matters are becoming serious. Old people about here say they have not seen anything like it in their lives; they have experienced a greater depth of snow in an exceptional storm but not a succession of so many storms in such a short period.

I have noticed that each snowfall during the three weeks was formed in the lower nimbus clouds, and came on suddenly, the air being very damp and misty. There were no high cumuli or cirri, but all seemed to be produced from the lower layers, a condition always favourable for large precipitation in these mountains. On March 10th only were there a few cirrus and high nimbus clouds, and the commencement of the snow appeared to be delayed on that occasion.

J. R. GETHIN JONES.

*Blaen-y-Cwm, Forest Coal Pit, near Abergavenny, March 11th, 1916.*

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## OPTICAL PHENOMENA.

SATURDAY morning, October 30th, was very foggy, especially in London, where it was extremely dense. About 11 a.m., as it seemed to be dissipating somewhat, I decided to go to Upper Norwood. On reaching the higher ground the sun slightly broke through the fog; and by the time I arrived at the Crystal Palace Parade it was shining on the Palace. On walking along the Parade I was much struck by the unusual appearance of the Crystal Palace, for the large Centre Trancept and the North Tower stood out very much larger and clearer than I had ever seen them before. They seemed to be *very near*, and every part was most *sharply defined*.

I was so much impressed by this peculiar appearance that I retraced my steps along the Parade in order to observe this remarkable phenomenon and to make sure that I had not been deceived

over it. I returned along the Parade about an hour later, when the fog had cleared away from the high ground, and there was a slight wind movement, but the appearance of the Palace was then quite normal.

I suppose this peculiar appearance of *nearness* and *largeness* was due to the increased size of the water particles associated with the fog. The Crystal Palace Parade is about 350 feet above sea level. WM. MARRIOTT.

*Egmont, Dulwich Wood Park, S.E.*

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At sunset this evening an unusual phenomenon was seen. There was a reddish glow on the top of the low clouds on the western horizon, and this glow was not bright, but dull red and reddish as the cloud extended about 10 degrees above the horizon and was dense and dark. Masses of nimbus were scattered about the sky; but on the east the clouds were much less dense and varied in colour from gray to white, with clear blue sky between and only a very indistinct floculence visible in some parts. During the day there had been slight passing showers of short duration and it felt somewhat warm and muggy. There was no thunder or lightning. In the east from the horizon to the zenith bright rays of light were observed varying in breadth and brightness; but all these rays were narrowest and densest and most deeply coloured at the horizon, and became much broader and fainter towards the zenith. The sky was of a beautiful blue between the thin clouds hovering about and where it was cloudless. Some of the rays were of a deep red at the horizon and faded off upwards into a pale pink, and some were of a bright deep yellow at the horizon and fading to a much lighter yellowish colour above. Some of the rays were about forty times broader than others, and in the spaces between the coloured rays the beautiful blue sky was seen. The rays spread out fan-like. During this time the sun continued setting without any unusual colouring, but no rays appeared on the western side. The rays and the beautiful colouring in the east continued visible for about fifteen minutes, altering slowly in intensity and beauty.

The Chief Officer was good enough to give me the following information as to the position and hour of the occurrence :—

On 28th September, 1915:—
Sun set ..... 5'59 at S.
Latitude ... .. 13°7'45'' N.
Longitude..... 26°11'45'' W.
130 miles S.W. of Brava Island (Cape Verde).

About 9 to 10 p.m. there was a sharp shower of rain with diffused lightning in the east, but apparently so far away that no thunder was heard. W. R. SCROGGIE.

*Surgeon.*

*R.M.S.P. "Demerara," Tropical Atlantic, 28th September, 1915.*

## ROYAL METEOROLOGICAL SOCIETY.

An ordinary meeting was held at the Society's rooms on February 16th Major H. G. Lyons, F.R.S., President, in the chair.

Mr. C. E. P. Brooks read a paper on "The Rainfall of Nigeria and the Gold Coast." The region investigated consists of the low-lying coastal area, including the delta of the Niger, and the interior plateau, merging into the desert, and intersected by the valleys of the Niger and Benue rivers. The rainfall data for Nigeria were reduced to a common period of 10 years 1904—1913 and maps were constructed showing the average distribution for each month and for the year. The annual rainfall ranges from about 160 inches on the coast to less than 10 inches on the north of the plateau. The monthly maps showed a minimum in January with a range from about 2 inches on the coast to almost rainless conditions in the north, and a maximum in June with about 28 inches in parts of the coast and less than 2 inches in the extreme north-east. The belt of maximum rainfall advanced inland during the first half of the year reaching its most northerly position in August. In this month there were areas of less than one inch along the south-east Gold Coast and in the south-west of Nigeria. In all the months the effect of the low-lying valleys of the great rivers was apparent in producing a smaller rainfall than the surrounding plateau. A special study of the rainfall and pressure observations taken at Zungeru, in the northern provinces of Nigeria, disclosed a fairly regular progression in the correlation coefficients between those elements, from a high positive value in April to a high negative value in August and back in October. The probable explanation was in the annual migrations of the equatorial belt of low pressure and the tropical "highs," the source of the rainfall of Nigeria being the moist indraught to replace the rising air in regions where the sun's rays fell vertically at noon. Popularly expressed: "the rain followed the sun." The oscillations of the pressure belt, with the consequent variations in the annual rainfall, appeared to be the governing factor of the climate.

Sir Napier Shaw, Mr. Carle Salter, and Mr. W. W. Bryant took part in a discussion as to the probable value of a 10-year period for studying tropical rainfall conditions. The President, Mr. W. B. Tripp and Mr. Barry Band also spoke.

A paper on "South African Coast Temperatures" by Dr. J. R. Sutton, was also read. A study of the mean monthly maximum and minimum temperatures for several stations led to the conclusion that the night temperatures of the coast were determined almost entirely by inland conditions whereas the day temperatures were modified by the sea. An explanation was sought in the lowering of the surface temperature of the sea by the churning effect of the spring gales.

Col. H. E. Rawson gave an account of the general pressure conditions in South Africa and their effect on the temperature.

New fellows elected: Capt. E. H. McLeish and Mr. C. E. Young.

## REVIEW.

*Temperature Inversions in Relation to Frosts.* By ALEXANDER MCADIE. Cambridge, U.S.A., 1915. Size, $11\frac{1}{2} \times 10$. Pp. 10. 4 plates.

THIS is a study of the temperature conditions during the occurrence of what is commonly known as "Up-bank thaw," illustrated by several figures showing the thermograph curves at the summit, base, and valley stations during typical cases. It is pointed out that when the air is in motion frost is not so likely as when the air is stagnant, and that "frost is more likely to occur when the upper air is dry than when it is moist." To give more definite information of humidity than that afforded by the instruments in general use, the author has invented a "saturation deficit recorder," which gives a continuous record of the weight of the vapour in grains per unit volume.

A considerable portion of the paper is taken up with the various methods employed in the United States for the protection of plants, etc., from injury by frost. It is pointed out that a rapid rise of temperature may do considerable injury to plant tissue, where no damage was originally done by the low temperature. R.C.M.

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## METEOROLOGICAL NEWS AND NOTES.

A PRESENTATION TO MR. W. MARRIOTT in commemoration of his long service as assistant secretary of the Royal Meteorological Society, was made at a recent meeting of the Council. It was felt that the circumstances of the time made it inappropriate to approach the fellows of the Society as a whole with the object of raising a more substantial mark of the appreciation in which several generations of Fellows have always held Mr. Marriott as an official, a friend and a fellow worker. Subscriptions were, however, offered by a number of past and present members of the Council of the Society, and the presentation took the form of a silver tea service with appropriate inscription and a typewriter. We feel that it will be a satisfaction to many friends and admirers of Mr. Marriott to know that his long and able services to meteorology and to the Society with which he was so completely identified, did not go without this well-deserved recognition.

MR. TH. HESSELBERG has been appointed Director of the Norwegian Meteorological Institute at Christiania.

ERRATUM. In last month's issue, page 13, the average annual rainfall at Seathwaite should read 129·48 inches, and at Cardiff, 42·28 inches.

## RAINFALL TABLE FOR FEBRUARY, 1916.

| STATION. | COUNTY. | Lat. N. | Long. W. [*E.] | Height above Sea. ft. | RAINFALL OF MONTH. Aver. 1875—1909. in. | 1916. in. |
|---|---|---|---|---|---|---|
| | | ° ′ | ° ′ | | | |
| Camden Square | *London* | 51 32 | 0 8 | 111 | 1·66 | 3·46 |
| Tenterden | *Kent* | 51 4 | *0 41 | 190 | 1·90 | 4·90 |
| Arundel (Patching) | *Sussex* | 50 51 | 0 27 | 130 | 2·17 | 5·29 |
| Fordingbridge (Oaklands) | *Hampshire* | 50 56 | 1 38 | 135 | 2·34 | 5·27 |
| Oxford (Magdalen College) | *Oxfordshire* | 51 45 | 1 15 | 186 | 1·62 | 3·60 |
| Wellingborough (Swanspool) | *Northampton* | 52 18 | 0 41 | 155 | 1·70 | 3·21 |
| Bury St. Edmunds (Westley) | *Suffolk* | 52 15 | *0 40 | 226 | 1·59 | 4·34 |
| Geldeston [Beccles] | *Norfolk* | 52 27 | *1 31 | 38 | 1·41 | 3·61 |
| Polapit Tamar [Launceston] | *Devon* | 50 40 | 4 22 | 315 | 2·95 | 7·99 |
| Rousdon [Lyme Regis] | ,, | 50 41 | 3 0 | 516 | 2·50 | 5·84 |
| Stroud (Field Place) | *Gloucestershire* | 51 44 | 2 13 | 226 | 2·12 | ... |
| Church Stretton (Wolstaston) | *Shropshire* | 52 35 | 2 48 | 800 | 2·17 | 5·07 |
| Boston | *Lincolnshire* | 52 58 | 0 1 | 11 | 1·53 | 3·74 |
| Worksop (Hodsock Priory) | *Nottinghamshire* | 53 22 | 1 5 | 56 | 1·64 | 3·65 |
| Mickleover Manor | *Derbyshire* | 52 54 | 1 32 | 280 | 1·71 | 4·95 |
| Macclesfield | *Cheshire* | 53 15 | 2 7 | 501 | 2·30 | 4·27 |
| Southport (Hesketh Park) | *Lancashire* | 53 39 | 2 59 | 38 | 2·07 | 2·97 |
| Arncliffe Vicarage | *Yorkshire, W.R.* | 54 8 | 2 6 | 732 | 4·88 | 7·60 |
| Goldsborough Hall | ,, ,, | 54 0 | 1 25 | 119 | 1·75 | 3·51 |
| Hull (Pearson Park) | ,, *E.R.* | 53 45 | 0 20 | 6 | 1·78 | 3·42 |
| Newcastle (Town Moor) | *Northumberland* | 54 59 | 1 38 | 201 | 1·63 | 2·74 |
| Borrowdale (Seathwaite) | *Cumberland* | 54 30 | 3 10 | 423 | 10·96 | 12·68 |
| Cardiff (Ely) | *Glamorgan* | 51 29 | 3 13 | 53 | 3·07 | 5·88 |
| Haverfordwest | *Pembroke* | 51 48 | 4 58 | 90 | 3·42 | 5·27 |
| Aberystwyth (Gogerddan) | *Cardigan* | 52 26 | 4 1 | 83 | 3·09 | 4·85 |
| Llandudno | *Carnarvon* | 53 20 | 3 50 | 72 | 2·11 | 3·71 |
| Cargen [Dumfries] | *Kirkcudbright* | 55 2 | 3 37 | 80 | 3·42 | 4·51 |
| Marchmont House | *Berwick* | 55 44 | 2 24 | 498 | 2·15 | 4·21 |
| Girvan (Pinmore) | *Ayr* | 55 10 | 4 49 | 207 | 3·87 | 4·86 |
| Glasgow (Queen's Park) | *Renfrew* | 55 53 | 4 18 | 144 | 2·70 | 4·42 |
| Islay (Eallabus) | *Argyll* | 55 47 | 6 15 | 68 | 3·91 | 5·66 |
| Mull (Quinish) | ,, | 56 34 | 6 13 | 35 | 4·45 | 5·56 |
| Balquhidder (Stronvar) | *Perth* | 56 21 | 4 23 | 422 | 6·33 | 9·77 |
| Dundee (Eastern Necropolis) | *Forfar* | 56 28 | 2 57 | 199 | 1·91 | 2·26 |
| Braemar | *Aberdeen* | 57 0 | 3 24 | 1114 | 2·55 | 5·70 |
| Aberdeen (Cranford) | ,, | 57 8 | 2 7 | 120 | 2·36 | 1·80 |
| Gordon Castle | *Moray* | 57 37 | 3 5 | 107 | 1·95 | 2·57 |
| Drumnadrochit | *E. Inverness* | 57 20 | 4 29 | 138 | 2·89 | 6·16 |
| Fort William | ,, ,, | 56 49 | 5 6 | 171 | 6·85 | 10·44 |
| Loch Torridon (Bendamph) | *W. Ross* | 57 32 | 5 32 | 20 | 7·53 | 10·50 |
| Dunrobin Castle | *Sutherland* | 57 59 | 3 56 | 14 | 2·58 | 3·14 |
| Killarney (District Asylum) | *Kerry* | 52 4 | 9 31 | 178 | 4·99 | 7·51 |
| Waterford (Brook Lodge) | *Waterford* | 52 15 | 7 7 | 104 | 3·18 | 4·64 |
| Nenagh (Castle Lough) | *Tipperary* | 52 54 | 8 24 | 120 | 2·89 | 5·54 |
| Ennistymon House | *Clare* | 52 57 | 9 18 | 37 | 3·44 | 6·15 |
| Gorey (Courtown House) | *Wexford* | 52 40 | 6 13 | 80 | 2·75 | 4·67 |
| Abbey Leix (Blandsfort) | *Queen's County* | 52 56 | 7 17 | 532 | 2·55 | 4·36 |
| Dublin (Fitz William Square) | *Dublin* | 53 21 | 6 14 | 54 | 1·93 | 3·56 |
| Mullingar (Belvedere) | *Westmeath* | 53 29 | 7 22 | 367 | 2·67 | 4·29 |
| Crossmolina (Enniscoe) | *Mayo* | 54 4 | 9 16 | 74 | 4·20 | 7·10 |
| Cong (The Glebe) | ,, | 53 33 | 9 16 | 112 | 3·72 | 5·62 |
| Collooney (Markree Obsy.) | *Sligo* | 54 11 | 8 27 | 127 | 3·20 | 4·62 |
| Seaforde | *Down* | 54 19 | 5 50 | 180 | 2·81 | 3·57 |
| Ballymena (Harryville) | *Antrim* | 54 52 | 6 13 | 150 | 2·99 | 4·62 |
| Omagh (Edenfel) | *Tyrone* | 54 36 | 7 18 | 280 | 2·68 | 4·16 |

## RAINFALL TABLE FOR FEBRUARY, 1916—*continued.*

| RAINFALL OF MONTH (*con.*) | | | | | RAINFALL FROM JAN. 1. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Diff. from Av. in. | % of Av. | Max. in 24 hours. in. | Max. in 24 hours. Date. | No. of Days | Aver. 1875—1909. in. | 1916. in. | Diff. from Aver. in. | % of Av. | Mean Annual 1875–1909. in. | STATION. |
| +1·80 | 208 | ·50 | 25 | 21 | 3·49 | 4·76 | +1·27 | 136 | 25·11 | Camden Square |
| +3·00 | 258 | ·75 | 28 | 23 | 4·04 | 6·05 | +2·01 | 150 | 27·64 | Tenterden |
| +3·12 | 244 | ·70 | 10 | 21 | 4·76 | 6·76 | +2·00 | 142 | 30·48 | Patching |
| +2·93 | 225 | 1·34 | 3 | 27 | 5·01 | 6·76 | +1·75 | 132 | 31·06 | Fordingbridge |
| +1·98 | 222 | ·67 | 3 | 19 | 3·40 | 4·97 | +1·57 | 146 | 24·58 | Oxford |
| +1·51 | 189 | ·46 | 14 | 22 | 3·60 | 4·79 | +1·19 | 133 | 25·20 | Swanspool |
| +2·75 | 273 | ·68 | 23 | 24 | 3·29 | 5·83 | +2·54 | 177 | 25·40 | Westley |
| +2·20 | 256 | ·56 | 11 | 23 | 2·94 | 5·11 | +2·17 | 174 | 23·73 | Geldeston |
| +5·04 | 271 | 1·62 | 3 | 24 | 6·54 | 10·06 | +3·52 | 155 | 38·27 | Polapit Tamar |
| +3·34 | 234 | 1·03 | 3 | 25 | 5·44 | 6·82 | +1·38 | 125 | 33·54 | Rousdon |
| ... | ... | ... | ... | ... | 4·45 | ... | ... | ... | 29·81 | Stroud |
| +2·90 | 234 | ·78 | 3 | 25 | 4·68 | 6·46 | +1·78 | 138 | 32·41 | Wolstaston |
| +2·21 | 244 | ·58 | 24 | 21 | 3·07 | 4·79 | +1·72 | 156 | 23·35 | Boston |
| +2·01 | 223 | ·49 | 11 | 20 | 3·34 | 4·09 | + ·75 | 122 | 24·46 | Hodsock Priory |
| +3·24 | 289 | 1·25 | 24 | 24 | 3·66 | 6·61 | +2·95 | 181 | 26·65 | Mickleover |
| +1·97 | 186 | ·70 | 6 | 24 | 4·96 | 5·91 | + ·95 | 119 | 34·73 | Macclesfield |
| + ·90 | 144 | ·41 | 10 | 21 | 4·62 | 4·28 | — ·34 | 93 | 32·70 | Southport |
| +2·72 | 156 | ·90 | 15 | 25 | 11·14 | 15·14 | +4·00 | 136 | 61·49 | Arncliffe |
| +1·76 | 201 | ·48 | 11 | 23 | 3·66 | 4·52 | + ·86 | 123 | 27·29 | Goldsborough Hall |
| +1·64 | 192 | ·41 | 11 | 22 | 3·48 | 4·01 | + ·53 | 115 | 26·42 | Hull |
| +1·11 | 168 | ·36 | 27 | 22 | 3·53 | 3·78 | + ·25 | 107 | 27·94 | Newcastle |
| +1·72 | 116 | 2·00 | 6 | 19 | 24·40 | 35·48 | +11·08 | 145 | 129·48 | Seathwaite |
| +2·81 | 191 | ·67 | 15 | 29 | 6·72 | 9·38 | +2·66 | 140 | 42·28 | Cardiff |
| +1·85 | 154 | ·88 | 3 | 23 | 8·11 | 8·36 | + ·25 | 103 | 46·81 | Haverfordwest |
| +1·76 | 157 | ·49 | 4 | 22 | 7·00 | 8·16 | +1·16 | 117 | 45·46 | Gogerddan |
| +1·60 | 176 | ·57 | 5 | 23 | 4·62 | 6·21 | +1·59 | 134 | 30·36 | Llandudno |
| +1·09 | 132 | ·67 | 3 | 21 | 7·52 | 11·19 | +3·67 | 149 | 43·47 | Cargen |
| +2·06 | 196 | ·75 | 18 | 24 | 4·55 | 6·45 | +1·90 | 142 | 33·76 | Marchmont |
| + ·99 | 126 | 1·40 | 4 | 18 | 8·65 | 11·29 | +2·64 | 131 | 49·77 | Girvan |
| +1·72 | 164 | ·61 | 12 | 22 | 6·23 | 9·60 | +3·37 | 154 | 35·97 | Glasgow |
| +1·75 | 145 | ·58 | 17 | 24 | 8·69 | 11·37 | +2·68 | 131 | 48·79 | Eallabus |
| +1·11 | 125 | 1·13 | 3 | 19 | 10·00 | 11·45 | +1·45 | 115 | 56·57 | Quinish |
| +3·44 | 154 | 1·53 | 3 | 21 | 15·07 | 24·56 | +9·49 | 163 | 73·77 | Stronvar |
| + ·35 | 118 | ·40 | 6 | 22 | 3·92 | 4·10 | + ·18 | 105 | 28·64 | Dundee |
| +3·15 | 224 | 1·06 | 3 | 21 | 5·47 | 10·09 | +4·62 | 185 | 34·93 | Braemar |
| — ·56 | 76 | ·42 | 15 | 20 | 4·72 | 2·71 | —2·01 | 57 | 32·73 | Aberdeen |
| + ·62 | 132 | ·63 | 15 | 23 | 3·94 | 4·66 | + ·72 | 118 | 30·34 | Gordon Castle |
| +3·27 | 213 | ·67 | 12 | 25 | 6·52 | 13·26 | +6·74 | 203 | 36·13 | Drumnadrochit |
| +3·59 | 152 | 1·73 | 3 | 21 | 16·05 | 25·63 | +9·58 | 159 | 75·80 | Fort William |
| +2·97 | 139 | 1·24 | 3 | 20 | 16·95 | 27·25 | +10·30 | 161 | 83·93 | Bendamph |
| + ·56 | 122 | ·90 | 6 | 15 | 5·33 | 8·28 | +2·95 | 155 | 31·90 | Dunrobin Castle |
| +2·52 | 150 | 1·07 | 2 | 26 | 10·93 | 11·66 | + ·73 | 107 | 54·81 | Killarney |
| +1·46 | 146 | ·58 | 14 | 24 | 6·96 | 6·53 | — ·43 | 94 | 39·57 | Waterford |
| +2·65 | 192 | ·75 | 15 | 25 | 6·77 | 8·82 | +2·05 | 130 | 39·43 | Castle Lough |
| +2·71 | 179 | ·74 | 3 | 23 | 7·74 | 10·28 | +2·54 | 133 | 46·52 | Ennistymon |
| +1·92 | 170 | ·80 | 3 | 22 | 5·94 | 6·14 | + ·20 | 103 | 34·99 | Courtown Ho. |
| +1·81 | 171 | ·66 | 15 | 26 | 5·70 | 6·38 | + ·68 | 112 | 35·92 | Abbey Leix |
| +1·63 | 184 | ·45 | 29 | 26 | 4·07 | 4·96 | + ·89 | 122 | 27·68 | Dublin |
| +1·62 | 161 | ·75 | 3 | 25 | 5·77 | 7·80 | +2·03 | 135 | 36·15 | Mullingar. |
| +2·90 | 169 | ·71 | 2 | 23 | 9·55 | 12·75 | +3·20 | 134 | 52·87 | Enniscoe |
| +1·90 | 151 | 1·11 | 14 | 20 | 8·51 | 11·00 | +2·49 | 129 | 48·90 | Cong |
| +1·42 | 144 | ·60 | 3 | 20 | 7·07 | 8·33 | +1·26 | 118 | 42·71 | Markree |
| + ·76 | 127 | ·57 | 29 | 22 | 6·22 | 5·87 | — ·35 | 94 | 38·91 | Seaforde |
| +1·63 | 154 | ·45 | 7 | 23 | 6·72 | 7·88 | +1·16 | 117 | 40·84 | Ballymena |
| +1·48 | 155 | ·68 | 15 | 23 | 6·14 | 7·88 | +1·74 | 128 | 39·38 | Omagh |

## SUPPLEMENTARY RAINFALL, FEBRUARY, 1916.

| Div. | STATION. | Rain inches. | Div. | STATION. | Rain inches. |
|---|---|---|---|---|---|
| II. | Warlingham, Redvers Road . | 5·76 | XI. | Lligwy | 3.99 |
| ,, | Ramsgate | 3·60 | ,, | Douglas | 3·28 |
| ,, | Hailsham | 5·17 | XII. | Stoneykirk, Ardwell House... | 2·99 |
| ,, | Totland Bay, Aston House... | 4·55 | ,, | Carsphairn Shiel | 8·00 |
| ,, | Stockbridge, Ashley.. | 6·01 | ,, | Beattock, Kinnelhead | 5·50 |
| ,, | Grayshott | 5·98 | ,, | Langholm, Drove Road | 4·38 |
| III. | Harrow Weald, Hill House... | 4·09 | XIII. | Selkirk, The Hangingshaw.. | 4·83 |
| ,, | Pitsford, Sedgebrook | 3·97 | ,, | North Berwick Reservoir... . | 2·76 |
| ,, | Woburn, Milton Bryant | 4·24 | ,, | Edinburgh, Royal Observaty. | 3·21 |
| ,, | Chatteris, The Priory | 3·15 | XIV. | Maybole, Knockdon Farm ... | 3·76 |
| IV. | Elsenham, Gaunts End | 3·54 | XV. | Buchlyvie, The Manse | 5·55 |
| ,, | Shoeburyness | 2·86 | ,, | Ballachulish House | 11·96 |
| ,, | Colchester, Hill Ho., Lexden | 3·76 | ,, | Oban | 6·04 |
| ,, | Ipswich, Rookwood, Copdock | 3·85 | ,, | Campbeltown, Witchburn .. | 5·05 |
| ,, | Aylsham, Rippon Hall | 3·97 | ,, | Holy Loch, Ardnadam | 12·15 |
| ,, | Swaffham .. | 3·83 | ,, | Tiree, Cornaigmore | 4·79 |
| V. | Bishops Cannings | 4·37 | XVI. | Dollar Academy | 4·78 |
| ,, | Wimborne, St. John's Hill ... | 6·06 | ,, | Glenlyon, Meggernie Castle.. | 10·09 |
| ,, | Ashburton, Druid House.. ... | 9·95 | ,, | Blair Atholl | 4·49 |
| ,, | Cullompton | 6·88 | ,, | Coupar Angus | 2·95 |
| ,, | Lynmouth, Rock House .. ... | 8·20 | ,, | Montrose, Sunnyside Asylum. | 2·21 |
| ,, | Okehampton, Oaklands.. ... | 8·58 | XVII. | Alford, Lynturk Manse | 2·60 |
| ,, | Hartland Abbey | 7·04 | ,, | Fyvie Castle | 2·36 |
| ,, | Probus, Lamellyn | 4·44 | ,, | Keith Station .. | 1·62 |
| ,, | North Cadbury Rectory. | 5·88 | XVIII. | Rothiemurchus | 6·76 |
| VI. | Clifton, Stoke Bishop | 5·41 | ,, | Loch Quoich, Loan | 17·95 |
| ,, | Ledbury Underdown | 4·40 | ,, | Skye, Dunvegan | 7·75 |
| ,, | Shifnal, Hatton Grange. | 4·39 | ,, | Lochmaddy, Bayhead | 2·60 |
| ,, | Droitwich | 3·58 | ,, | Fortrose | 3·02 |
| ,, | Blockley, Upton Wold | 5·01 | ,, | Glencarron Lodge | 7·11 |
| VII. | Market Overton | 5·79 | XIX. | Altnaharra | 5·31 |
| ,, | Market Rasen | 3·69 | ,, | Melvich | 3·00 |
| ,, | Bawtry, Hesley Hall | 3·36 | ,, | Loch More, Achfary | 7·53 |
| ,, | Derby, Midland Railway | 4·59 | XX. | Dunmanway, The Rectory ,. | 7·39 |
| ,, | Buxton | 6·57 | ,, | Glanmire, Lota Lodge | 4·37 |
| VIII. | Nantwich, Dorfold Hall | 3·37 | ,, | Mitchelstown Castle | 4·86 |
| ,, | Chatburn, Middlewood | 4·40 | ,, | Darrynane Abbey | 6·76 |
| ,, | Lancaster, Strathspey | 3·35 | ,, | Clonmel, Bruce Villa | 3·79 |
| IX. | Langsett Moor, Up. Midhope | 5·92 | ,, | Newmarket-on-Fergus, Fenloe | ... |
| ,, | Scarborough, Scalby | 3·53 | XXI. | Enniscorthy, Ballyhyland... | 5·96 |
| ,, | Ingleby Greenhow | 3·58 | ,, | Rothnen, Clonmannon | 3·51 |
| ,, | Mickleton | 4·80 | ,, | Ballycumber, Moorock Lodge | 3·24 |
| X. | Bellingham, High Green Manor | 4·19 | ,, | Balbriggan, Ardgillan .. | 2·83 |
| ,, | Ilderton, Lilburn Cottage ... | 3·13 | ,, | Castle Forbes Gardens | 3·48 |
| ,, | Thirlmere, The Bank | 6·08 | XXII. | Ballynahinch Castle | 6·62 |
| XI. | Llanfrechfa Grange | 5·43 | ,, | Woodlawn | 3·80 |
| ,, | Treherbert, Tyn-y-waun | 13·01 | ,, | Westport, St. Helens ... | 6·12 |
| ,, | Carmarthen, The Friary | 5·02 | ,, | Dugort, Slievemore Hotel ... | 7·17 |
| ,, | Fishguard, Goodwick Station. | 3·70 | XXIII. | Enniskillen, Portora | 4·93 |
| ,, | Crickhowell, Tal-y-maes | 6·50 | ,, | Dartrey [Cootehill] | 3·47 |
| ,, | New Radnor, Ednol | 7·55 | ,, | Warrenpoint, Manor House .. | 3·21 |
| ,, | Birmingham WW., Tyrmynydd | 8·74 | ,, | Belfast, Cave Hill Road | 4·09 |
| ,, | Lake Vyrnwy | 6·90 | ,, | Glenarme Castle | 6·04 |
| ,, | Llangynhafal, Plâs Drâw | 4·12 | ,, | Londonderry, Creggan Res... | 4·87 |
| ,, | Dolgelly, Bryntirion | 5·55 | ,, | Dunfanaghy, Horn Head ... | 5·42 |
| ,, | Bettws-y-Coed, Tyn-y-bryn... | 7·02 | ,, | Killybegs | 6·31 |

# THE WEATHER OF FEBRUARY.

THE peculiar pressure conditions which characterized January continued in the early days of February, the barometer being high in the south-west of Europe, whilst low pressure systems passed eastwards to the north of the British Isles. In these circumstances the wind blew uninterruptedly from a westerly quarter and the temperature remained high for the time of year. There was a considerable amount of sunshine, especially in the north, but rain was frequent, and on the 3rd more than an inch of rain fell over a large area in the west, accompanied by a south-westerly gale. After about the 8th, pressure conditions became somewhat modified and with lower barometer readings over England the wind shifted intermittently into the north or north-west, and the temperature fell to the normal. The weather continued sunny, especially in England, but precipitation occurred almost daily in all parts of the country, taking the form of snow in the north generally. In the west of Scotland there were winter thunderstorms on several days. About the 12th the westerly type of weather conditions again set in, and the weather was on the whole sunny in the south, where the temperature rather high, though it was normal elsewhere. On the 14th, however, these conditions were temporarily interrupted by the passage of a small secondary disturbance which brought heavy rain and snow in some parts of England. On the 22nd a well-marked high pressure system developed to the north-west. of the British Isles, and the wind blew from the north, veering to north-east as the anticylcone spread eastwards. The weather in the north of Scotland under the influence of this anticyclone, though cold, was sunny and dry until the end of the month, but in England gloomy sunless conditions prevailed with low temperature and frequent heavy snow. Over a large part of the country snow lay on the ground continuously from the 22nd well into March, an extremely unusual phenomenon in the south of England so late in the season. The storms were probably most severe in the Black Mountains in Breconshire, where it is estimated that the aggregate depth of snow-fall from the 22nd to the end of the month reached five feet. Over the Cotteswolds and in the Midlands considerable drifting occurred. The total rainfall during the month was most excessive in the south-east of the country generally, more than twice the average falling everywhere south-east of a line drawn from Hull to Cardiff. A small area in Scotland extending from Braemar to Inverness also had about double the average. On the other hand the extreme north-east of Scotland was comparatively dry. The remainder of the country had a fairly uniform excess of about 50 per cent. The general rainfall of the larger divisions of the United Kingdom, expressed as a percentage of the average, was, England and Wales, 193 per cent.; Scotland, 150 per cent; Ireland, 160 per cent.; British Isles, 170 per cent. Only a very narrow strip of the east coast and a small part of the Cheshire plain had less than 3 in. of rain during the month. More than 5 inches fell over the western and central parts of Scotland, the whole of the Pennines and practically the whole of Wales and the southern counties of England, while more than 8 inches fell over extensive areas in the more elevated districts of the west. In Ireland more than 5 inches fell everywhere in the west and rather less than 3 inches on part of the east coast.

The duration of bright sunshine was :—Camden Square, 65 hours; Totland Bay, 80 hours; Felstead, 83 hours; Ipswich, 67 hours; Weymouth, 77 hours; Sidmouth, 81 hours; Ilfracombe, 60 hours; Matlock, 58 hours; Bolton, 36 hours; Southport, 76 hours; Hull, 45 hours; Haverfordwest, 77 hours; Swinton (Berwickshire), 67 hours; Paisley, 53 hours; Perth, 79 hours.

In London (Camden Square) the mean temperature of the month was 39°·7, or exactly the average. The duration of rainfall was 90·9 hours, being 51·9 hours above the average of the previous 35 years, and the greatest duration recorded in February since records commenced in 1881.

## Climatological Table for the British Empire, September, 1915.

| STATIONS. (*Those in italics are South of the Equator.*) | Absolute. Maximum. Temp. | Date. | Minimum. Temp. | Date. | Average. Max. | Min. | Dew Point. | Humidity. | Absolute. Max. in Sun. | Min. on Grass. | Total Rain Depth. | Days. | Aver. Cloud. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ° | | ° | | ° | ° | ° | 0-100 | ° | ° | inches | | |
| London, Camden Square | 80·0 | 16 | 35·6 | 30 | 69·2 | 49·9 | 51·0 | 80 | 128·8 | 31·9 | 1·86 | 5 | 4·2 |
| Malta ... ... ... | 89·2 | 1 | 64·0 | 16 | 78·2 | 66·8 | ... | 77 | 138·0 | ... | 2·16 | 5 | 0·9 |
| Lagos ... ... ... | 94·0 | 25 | 70·0 | 15 | 84·4 | 74·5 | 73·5 | 82 | 154·0 | 67·0 | 10·34 | 24 | 8·6 |
| *Cape Town* ... ... | 82·2 | 13 | 41·8 | 10 | 65·0 | 49·5 | 54·1 | 73 | ... | ... | 2·55 | 16 | 7·2 |
| *Natal, Durban* ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Johannesburg* ... .. | 77·8 | 21 | 29·4 | 12 | 68·1 | 48·0 | 37·4 | 58 | ... | 28·0 | 1·65 | 4 | 4·1 |
| *Mauritius* ... ... | 81·0 | 25 | 56·7 | 19 | 77·5 | 62·6 | 59·1 | 70 | ... | 47·7 | 1·06 | 12 | 5·2 |
| *Bloemfontein* . ... | 82·4 | 18 | 28·7 | 12 | 73·4 | 40·1 | 40·3 | 55 | .. | ... | ·94 | 3 | 4·9 |
| Calcutta... ... ... | 92·3 | 2 | 73·8 | 26 | 88·8 | 77·8 | 77·1 | 84 | ... | 63·9 | 10·45 | 16 | 7·4 |
| Bombay... ... ... | 87·5 | 20 | 75·4 | 9 | 85·5 | 77·4 | 76·3 | 85 | 133·2 | 62·1 | 10·21 | 14 | 6·7 |
| Madras ... ... ... | 101·3 | 10 | 72·8 | 17 | 92·9 | 77·4 | 73·8 | 76 | 163·5 | 71·6 | 10·43 | 14 | 6·1 |
| Colombo, Ceylon ... | 87·1 | 14 | 71·6 | 21 | 85·0 | 75·4 | 74·0 | 85 | 161·3 | 68·8 | 7·18 | 26 | 7·4 |
| Hongkong ... ... | 90·0 | 2 | 67·6 | 26 | 85·4 | 76·9 | 72·4 | 75 | ... | ... | 5·72 | 10 | 5·2 |
| *Sydney* ... ... ... | 84·0 | 4 | 43·9 | 1 | 70·8 | 52·6 | 45·1 | 54 | 135·3 | 34·4 | 1·44 | 12 | 2·7 |
| *Melbourne* ... ... | 74·1 | 23 | 39·9 | 10 | 64·3 | 47·7 | 44·0 | 62 | 127·4 | 31·8 | 2·19 | 18 | 5·3 |
| *Adelaide* ... ... | 81·1 | 25 | 43·6 | 27 | 66·0 | 49·4 | 47·4 | 68 | 133·5 | 38·1 | 3·57 | 20 | 5·0 |
| *Perth* ... ... ... | 65·9 | 11 | 40·8 | 18 | 62·3 | 51·0 | 48·9 | 75 | 141·4 | 34·9 | 4·72 | 26 | 7·2 |
| *Coolgardie* ... ... | 90·4 | 28 | 35·6 | 10 | 68·3 | 44·4 | 39·9 | 48 | 142·0 | 32·2 | ·29 | 5 | 2·9 |
| *Hobart, Tasmania* .. | 74·1 | 25 | 34·9 | 11 | 59·6 | 44·1 | 39·2 | 58 | 128·0 | 26·2 | 1·27 | 16 | 6·2 |
| *Wellington* ... ... | 68·8 | 28 | 34·8 | 8 | 57·3 | 45·4 | 47·2 | 77 | 127·8 | 24·2 | 1·62 | 12 | 7·2 |
| *Auckland* ... ... | 70·0 | 16 | 43·5 | 3 | 62·6 | 52·1 | 51·6 | 76 | 132·0 | 38·0 | 5·32 | 20 | 6·4 |
| Jamaica, Kingston .. | 93·0 | 23 | 71·6 | 2 | 88·7 | 74·2 | 72·4 | 82 | ... | ... | 11·90 | 9 | 5·9 |
| Grenada ... ... | 90·0 | 27 | 70·0 | 3 | 86·0 | 75·0 | ... | 79 | 137·0 | ... | 5·72 | 19 | 3·5 |
| Toronto ... ... ... | 87·3 | 14* | 31·4 | 28 | 72·9 | 53·7 | 55·1 | 83 | 139·8 | 28·8 | 4·24 | 12 | 4·0 |
| Fredericton ... ... | 82·0 | 10 | 30·0 | 26 | 68·5 | 46·7 | 50·8 | 78 | ... | ... | 2·93 | 6 | 4·9 |
| St. John, N.B. ... | 79·3 | 11 | 37·0 | 26 | 64·5 | 49·6 | 55·6 | 75 | ... | ... | 2·61 | 7 | 4·9 |
| Alberta, Edmonton ... | 76·6 | 3 | 20·8 | 12 | 59·5 | 37·9 | ... | 72 | 136·0 | 12·0 | 1·14 | 11 | 6·2 |
| Victoria, B.C. ... ... | 72·8 | 20 | 44·8 | 28 | 63·5 | 49·6 | 49·0 | 80 | 137·0 | 36·0 | ·80 | 6 | 4·3 |

* and 15

MALTA.—Thunderstorm on the 11th and 12th.

*Johannesburg.*—Bright sunshine 263·5 hours.

*Mauritius.*—Mean temp. normal and R ·47 in. below average.

*Bloemfontein.*—A windy month.

COLOMBO, CEYLON.—Mean temp. 80°·2 or 0°·8 below, dew point 0°·4 above, and R 3·14 in. above, averages.

HONGKONG.—Mean temp. 80°·9, mean hourly velocity of wind, 10·7 miles. Bright sunshine 234·2 hours.

*Melbourne.*—Mean temp. 2°·0 above, and R ·12 in. below, averages.

*Adelaide.*—Mean temp. 0°·7 above and R 1·63 in. above, averages. Lowest mean pressure for any month for last 58 years. Gales on 13 days, a record.

*Coolgardie.*—Temp. 2°·2 below and R nearly half an inch below, averages.

*Hobart.*—Mean temp. 1°·0 above, and R ·85 in below, averages.

*Wellington.*—Mean temp. 3°·0 above and R 2·62 in. below average. Bright sunshine 156·8 hours.

*Auckland.*—Wet warm and cloudy; mean temp. 2°·5 above, and R nearly two inches above, averages.